US EPA OECA
AIR INSPECTION REPORT

FRS #:	**Not Applicable**	Inspection Dates:	**September 26-30, 2016**
AFS #:	**Not Applicable**		
Inspection Type:	Clean Air Act, Partial Compliance Evaluation		
Company Name:	**MARATHON OIL CORPORATION**		
Facility Name:	**MARATHON OIL CORPORATION, VARIOUS EAGLE FORD SITES**		
Physical Location:	*Several Facilities-see report*		
Mailing Address:	5253 Prue Road San Antonio, TX 78249		
County/Parish:	**KARNES COUNTY**		
Reg. Programs:	**SIP, Title V, and NSPS**		
SIC Code:	**1311 Crude Petroleum and Natural Gas**		

Facility Representatives:

Jon Kizzee	HES Manager Eagle Ford Shale	Not Provided
Kimber Hamilton	Environmental Supervisor	210-877-8451
Aaron Hutchinson	HES Professional	210-877-8420
Justin Van Ness	Production Supervisor	Not Provided

EPA Inspectors:

Christopher Williams	Chemical Engineer	202-564-7889
Nicole Radford	Environmental Engineer	404-562-9099

EPA Inspector: Christopher Williams 1/24/2017
Christopher Williams, Chemical Engineer (Date)

EPA Inspector: Nicole Radford 1/24/2017
Nicole Radford, Environmental Scientist (Date)

CONTENTS:

This inspection report is comprised of the following sections:

SECTION 1 – PURPOSE OF THE INSPECTION

The government inspection team, including US Environmental Protection Agency (EPA), Office of Enforcement and Compliance Assistance (OECA), Air Enforcement Division (AED) inspector Christopher Williams, and EPA Region 4, North Air Enforcement and Toxics Section, Air, Pesticides, and Toxics Management Division inspector Nicole Radford, arrived at the offices of the Marathon Oil Corporation (Marathon Oil) located at 5022 FM 2102, Kenedy, TX, 78118 at 10:00 AM on September 26, 2016, for a previously arranged, announced site visit.

Christopher Williams and Nicole Radford presented their inspector credentials to Kimber Hamilton, the EHS Supervisor of Marathon Eagle Ford Asset Team. The government inspection team met with representatives from Marathon Oil, including: Jon Kizzee, HES Manager Eagle Ford; Kimber Hamilton, Environmental Supervisor; and Aaron Hutchinson, HES Professional.

Christopher Williams informed the Marathon Oil representatives that the purpose of this EPA inspection was to evaluate the compliance status of oil and gas production facilities in the Eagle Ford Shale with applicable requirements of the Clean Air Act (CAA). The scope of the inspection was a partial compliance evaluation (PCE) including evaluation of the compliance status of the facility with applicable CAA regulations, Title V operating permit requirements, and Texas State Implementation Plan (SIP) regulations. The primary objectives were for the EPA inspectors to evaluate on-site conditions, and conduct an emissions survey at production facilities in Karnes County. The Marathon representatives notified the EPA inspectors that due to risk of H_2S exposure, air assist respirators would be needed if the inspection team wanted to climb the condensate and produced water tanks at the production facilities in Karnes County.

SECTION 2 – GENERAL FACILITY DESCRIPTION

In general, each of the facilities receives comingled fluids consisting of crude oil, condensate, produced water, and natural gas from wells located in the area. These raw products upon entering the facility are transported to a phase separator, where the gas is separated from the fluids. The liquids from the phase separator are routed to a heater treater then to a reid vapor pressure tower (stabilizer) and, then to a vapor recovery tower. Water is separated from the oil

in the heater treater and is transported to produced water tanks. Flash gases are collected at the stabilizer and vapor recovery tower and are routed to the gas stream. The remaining crude oil, and condensate are transported to the crude oil/condensate tanks. Vapors from the storage tanks are routed to vapor recovery units. The oil and produced water are loaded into trucks for removal from the site and sometimes transported via pipeline (when available). The gas is sent to compressors, treated for H_2S, and dehydrated prior to being transported to sales. The following facilities differed from the general description, as noted below:

- The Coy City Ranch A and Coy City Ranch B facilities are older facilities that are smaller in size and capacity. At these facilities there were no vapor recovery towers, or stabilizers. The condensate was routed directly to the facility's condensate tanks from the heater treater and there were no vapor recovery units connected to the tank battery. In addition, gas compressors were used to transport the gas from the facility.
- Hemby Unit B is a wellhead facility that contains phase separators that separate the gas from the liquid for royalty metering purposes. The material streams are recombined immediately after being separated and metered, and sent to the production facility.

SECTION 3 – SITE VISITS

On September 26, 2016, through September 29, 2016, the government inspection team accompanied by Jon Kizzee, Kimber Hamilton, Aaron Hutchinson, and Justin Van Ness performed in-depth facility tours and field emissions surveys at 17 production facilities and 1 well head in Karnes County. Jon Kizzee was in-person during the site visit performed on September 26, 2016, and was present via web conference during the exit interview on September 29, 2016, however, he was not present on the days that followed.

In general, the inspection team surveyed emissions from process piping and equipment at the production facilities. The inspection team performed more thorough emissions surveys at tank batteries, lact pumps, vapor recovery units, combustion control devices, and compressors at each of the facilities, since those were primary areas of focus. However, at the Barracuda facility on September 27, the EPA inspection team noted excessive emissions from the sump connected to one of the facility compressors and from that point forward began surveying sumps at each of the facilities. All emissions surveys were conducted by the government inspection team using the following equipment:

- Infrared (IR) camera manufactured by FLIR, Model GF-320, serial number 44401082. Optical gas imaging, IR camera surveys of emissions sources, were each conducted first in high sensitivity mode (HSM) for screening purposes, and then in full automatic mode (auto). Nicole Radford operated the FLIR camera during the inspection.
- A digital camera was used to take photographs in visible light. Christopher Williams operated the digital camera during the inspection.
- PID manufactured by Ion Science, PhoCheck Tiger, serial number T-106386 with a 10.6 eV lamp. The PID was used to survey facilities for emissions of volatile organic compounds (VOC). The PID was calibrated with isobutylene, and is capable of detecting VOC as low as 1 ppb, depending on the gas. The PID was set to background at each day

to measure concentrations above background levels. Christopher Williams operated the PID during the inspection.

- Christopher Williams and Nicole Radford used 4-gas meters for safety screening of hydrogen sulfide concentrations, oxygen concentration deficiencies, and lower explosive levels (LELs).

SECTION 4 – EXIT MEETING

A site visit exit meeting was held on September 30, 2016, starting at approximately 10:00 AM until 11:15 AM, between the government inspection team: Christopher Williams, and Nicole Radford, and Marathon representatives: Kimber Hamilton, Aaron Hutchinson, Jon Kizzee (via teleconference), Jeff Schwartz, Regional Operations Manager, and Avery Carson, Attorney (via teleconference). Christopher Williams identified four areas of significance resulting from the government inspection teams site visits and emissions surveys. Data collected and the observations made by the government inspection team during the site visits performed September 26 through September 30 are documented in SECTION 5 of this report.

1) *Emissions from Condensate/Crude Oil Tanks*
   The government inspection team noted leaking from several tanks at the facilities inspected while viewing tanks batteries through the FLIR camera. In most cases the inspectors were unable to determine the source of emissions due to the company's policy that prohibits individuals from accessing the tank area without supplied air respirators. The policy made it a challenge to fully assess if excessive emissions were emanating from tank battery's. Nicole Radford showed FLIR video, MOV_0106, taken of the tank battery at Coy City Unit B to illustrate, one of the sites that had the greatest emissions from tanks visible through the FLIR camera. Christopher Williams noted that EPA may want to do a design analysis to determine if the issues were design or O&M related at the locations where emissions were observed. However, at most sites the government inspection team noted, Marathon used air assist flares designed to combust excess emissions from the headspaces of tanks, had 4 to 6-inch diameter piping on the tank battery closed vent systems to promote transport of tank emissions to control devices, and also used stabilizers and vapor recovery towers to minimize flash emissions from the condensate prior to storage.

2) *Emissions from Back Pressure Valves on Vapor Recover Units (VRUs)*
   Christopher Williams noted that emissions were seen through the FLIR camera at almost all of the vapor recover units surveyed at the facilities. Nicole Radford stated that the emissions were seen coming from the back pressure valves and showed FLIR video, MOV_0016, to illustrate an example of the leak. Christopher Williams noted that what made the emissions most significant was that there were several VRUs that did not exhibit leaking from the valves and at least one facility, Challenger, contained no leaking from the VRUs.

3) *Emissions from Compressors*
Christopher Williams stated that emissions were detected emanating from most of the natural gas compression units. Specifically, emissions were measured and seen originating from compressor's crank case vents and packing vents.

4) *Emissions from Equipment Drains and Sumps*
Christopher Williams stated that emissions were seen emanating from and measured at several of the facility sumps that collect waste from equipment drains. Sumps were not originally an area focus, but were first detected at the Baracuda facility on September 27, and then became a focal point of the inspection at each facility. Nicole Radford showed MOV_0060 recorded at the Barracuda facility, MOV_0072 recorded at the Central Longhorn facility, and MOV_0091 and MOV_0094 recorded at the Challenger Facility to illustrate the types of emissions seen emanating from the sumps. Mr. Williams notified the Marathon representatives that this was an area of concern since the sump containers are not pressure rated and are not designed for hydrocarbon service. The PID measured VOC emissions from the compressor sump vents at levels > 20,000 ppm above background concentrations at the Barracuda and Challenger Central facilities. At the Challenger Central facility, it appeared that compressor exhaust was leaking into the sump as a source of the emissions, however, it was not apparent as to the source of the emissions from the compressor sump at the Barracuda facility. Mr. Christopher Williams stated that there were other potential sources for the emissions detected at the sumps including hydrocarbon product leaking from the equipment into the drainage system, and the wastes disposal practices of operators that may include flushing toxic solvents used to clean equipment into sumps.

In the close-out meeting, Christopher Williams requested that Marathon provide all operating permits and air permit documentation, including applications, technical review memos, and permits for each of the facilities visited. Nicole Radford requested Marathon to provide the brochure or cut-sheet for the "leaking" backpressure valves. Marathon agreed to provide the information to EPA within 30 days of the inspection. On October 4, 2016, Christopher Williams memorialized the request in an email addressed to Kimber Hamilton.

SECTION 5 – OBSERVATIONS AND EMISSIONS SURVEY DATA

The following sections detail the data collected and observations noted at each of the Marathon facilities visited. Post inspection of each facility, Marathon representatives provided EPA with facility diagrams (see ATTACHMENT 1). In addition, at the request of Christopher Williams, Aaron Hutchinson, provided three technical drawings illustrating the design of the sump and an example of the drainage connecting to the sump (see ATTACHMENT 2)

EAST SUGAR LOAF FACILITY
Date: September 26, 2016
Arrival Time: 11:22 AM
Exit Time: 12:49 PM
GPS Coordinates: N 28° 49.452', W 97° 56.339'
Temperature: 77 °F
Weather Conditions: Cloudy with moderate/light winds to the South

TABLE 1 – VIDEO, PHOTO, AND PID LOG FOR EAST SUGAR LOAF FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000136	Entrance Signage	Comingled Permit # and Well Names
P1000137	Entrance Signage	Facility Location and Emergency Contact Info
MOV_0001	Condensate Tanks ABJ-2040, ABJ-2060 and unknown tank number	Thief hatches on all 3 tanks
MOV_0002	Condensate Tank – unknown tank number	Thief hatch continuously leaking
MOV_0003	Condensate Tank – unknown tank number	Thief hatch intermittently leaking
MOV_0004	Condensate Tanks – unknown tank numbers	Thief hatch leak on 1st tank and possible leak on 2nd tank
MOV_0005	Vapor Recovery Unit (VRU) #2	Back pressure control valve
MOV_0006	Over view of compressors	Compressor vent stacks
MOV_0007	Condensate tank battery overview	Reshoot of condensate tanks at facility request b/c of pressure imbalance from compressor work.
Notes:	PID measurement downwind of the tank battery was 2.5 ppm above background concentrations. Kimber Hamilton notified the EPA inspectors that work was being performed on two of the gas compressors at the facility. Marathon representatives stated that this work was creating fluctuations in operating pressures and causing excess emissions. Justin Van Ness directed the Facility operator to equalize the station operating pressure. Nicole Radford recorded FLIR video of the tank battery to record any change in emissions.	

WEST SUGAR LOAF FACILITY
Date: September 26, 2016
Arrival Time: 1:45 PM
Exit Time: 3:02 PM
GPS Coordinates: N 28º 47.406', W 97º 59.668'
Temperature: 83 ºF
Weather Conditions: Mostly cloudy with moderate winds to the South

TABLE 2 – VIDEO, PHOTO, AND PID LOG FOR WEST SUGAR LOAF FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Equipment	Description
P1000138	Entrance Signage	Comingled Permit # and Well Names
P1000139	Entrance Signage	Facility Location and Emergency Contact Info
P1000140	Not Applicable	Photo of ground
DC_0008	IR photo of SLW-ABJ-2050	IR photo of tank ABJ-2050
MOV_0009	Condensate tank SLW-ABJ-2050	Thief hatch
MOV_0010	VRU #6	Back pressure controller valve
MOV_0011	VRU #5	Back pressure controller valve
MOV_0012	VRU #4	Back pressure controller valve
MOV_0013	VRU #3	Back pressure controller valve and pressure gauge
MOV_0014	VRU #1	Back pressure controller valve
MOV_0015	Compressor #12-0313	Pneumatic controller
Notes:	PID measurements downwind of tank battery ranged between 0.171 ppm and 0.191 ppm above background concentrations.	

WEST KARNES FACILITY
Date: September 26, 2016
Arrival Time: 3:13 PM
Exit Time: 4:07 PM
GPS Coordinates: N 28º 46.297', W 98º 1.730'
Temperature: 80 ºF
Weather Conditions: Mostly cloudy with moderate winds to the South

TABLE 3 – VIDEO, PHOTO, AND PID LOG FOR WEST KARNES FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Equipment	Description
P1000141	Entrance Signage	Comingled Permit # and Well Names
MOV_0016	VRU #5	Back pressure controller valve
MOV_0017	Condensate tank ABJ-2100	Thief hatch
MOV_0018	Condensate tank ABJ-2150	Thief hatch

MOV_0019	Condensate tanks ABJ-2200 and ABJ-2230	Thief hatch
MOV_0020	Compressor #3	Packing vent
Notes:	PID measurement downwind of tank battery was 0.125 ppm above background concentration.	

EAST KARNES FACILITY
Date: September 27, 2016
Arrival Time: 9:20 AM
Exit Time: 10:56 AM
GPS Coordinates: N 28º 47.713', W 97º 55.480'
Temperature: 72 ºF
Weather Conditions: Cloudy with moderate winds to the South

TABLE 4 – VIDEO, PHOTO, AND PID LOG FOR EAST KARNES FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Equipment	Description
P1000142	Entrance Signage	Comingled Permit # and Well Names
P1000143	Entrance Signage	Facility Location and Emergency Contact Info
MOV_0021	VRU #6	Back pressure relief valve
MOV_0022	VRU #1	Back pressure relief valve
MOV_0023	VRU #2	Back pressure relief valve
MOV_0024	VRU #3	Back pressure relief valve
MOV_0025	VRU #5	Back pressure relief valve
MOV_0026	Sales gas analyzer	Gauge before analyzer
MOV_0027	Compressor #9	Packing vent leak
MOV_0028	Compressor #8	Packing vent leak
MOV_0029	Compressor #5	Packing vent leak
MOV_0030	Not Applicable	Video of camera lens cap
MOV_0031	Compressor #4	General leak; couldn't find exact location for leak
MOV_0032	Compressor #2	Packing vent leak
MOV_0033	Sump between compressors' #2 and #3	Leak from vent pipes on lid of concrete sump
MOV_0034	Compressor #1	Packing vent
Notes:	VRU #4 was not in operation during the EPA visit to the facility. PID measurements downwind of VRUs ranged between 0.7 ppm and 1.0 ppm above background concentration. PID measurements downwind of the analyzer gauge was 6.0 ppm to 8.0 ppm above background concentration. PID measurements downwind of the Compressor #5 crankcase was 0.5 ppm above background concentration. PID measurements downwind of the Compressor #4 ranged between 0.700 ppm to 0.953 ppm above background concentration.	

	PID measurement at the sump vent located in between Compressor #1 and #2 was 2.6 ppm above background concentration. Aaron Hutchinson indicated that at some facilities it appeared as though the compressor packing vents were leaking into the sumps via the equipment drainage piping, which was creating emissions from the sump vents. The sumps are concrete boxes, they are not rated for hydrocarbon service, nor are they designed to withstand high pressures.

SOUTH SUGARLOAF FACILITY
Date: September 27, 2016
Arrival Time: 11:20 AM
Exit Time: 12:49 PM
GPS Coordinates: N 28º 44.136', W 98º 1.622'
Temperature: 75 ºF
Weather Conditions: Cloudy with light to moderate winds to the South

TABLE 5 – VIDEO, PHOTO, AND PID LOG FOR SOUTH SUGARLOAF FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Equipment	Description
P1000144	Entrance Signage	Comingled Permit # and Well Names
P1000145	Entrance Signage	Facility Location and Emergency Contact Info
MOV_0035	Condensate Tank #131124	Thief hatch
MOV_0036	Produced Water Tank #20143728	Thief hatch
MOV_0037	VRU #5	Back pressure control valve
MOV_0038	VRU #4	Back pressure control valve
MOV_0039	VRU #3	Back pressure control valve
MOV_0040	Compressor #11-0209	Packing vent
MOV_0041	Compressor #11-0209	Packing vent from other side of the compressor
MOV_0042	Compressor #11-0210	Packing vent
MOV_0043	Compressor #12-0305	Packing vent
MOV_0044	Compressor #11-0205	Packing vent
MOV_0045	Compressor #13-0319	Packing vent
MOV_0046	High Pressure Flare	Visible light (normal) mode only
MOV_0047	Sump between #13-0319 and #13-0334	PVC vents on the lid to the concrete sump; 142 ppm PID reading
MOV_0048	Compressor #13-0334	Packing vent leak
Notes:	PID measurement at the sump vent located in between Compressor 13-0319 and 13-0334 was 142 ppm above background concentration. PID measurements downwind of Compressor 13-0319 and 13-0334 were both 5.0 ppm above background concentration.	

SOUTH KARNES FACILITY
Date: September 27, 2016
Arrival Time: 12:59 PM
Exit Time: 14:09 PM
GPS Coordinates: N 28º 45.565', W 97º 59.143'
Temperature: 80 ºF
Weather Conditions: Cloudy with light to moderate winds to the South

TABLE 6 – VIDEO, PHOTO, AND PID LOG FOR SOUTH KARNES FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000146	Entrance Signage	Comingled Permit # and Well Names
MOV_0049	VRU #1	Back pressure control valve leak; 38 ppm PID reading
MOV_0050	Compressor #15-0383	Packing vent leak; 150 ppm PID reading
MOV_0051	Compressor #15-0382	Packing vent
MOV_0052	Compressor #7	Packing vent
MOV_0053	Compressor #6	Packing vent
MOV_0054	Compressor #5	Packing vent
MOV_0055	Compressor #3	Packing vent
MOV_0056	Compressor #2	Packing vent
Notes:	PID measurements at the sump vents located in between the compressors ranged from 3.5 ppm and 150 ppm above background concentration.	

BARRACUDA CENTRAL FACILITY
Date: September 27, 2016
Arrival Time: 2:20 PM
Exit Time: 3:25 PM
GPS Coordinates: N 28º 46.440', W 97º 57.238'
Temperature: 81 ºF
Weather Conditions: Cloudy with light to moderate winds to the South

TABLE 7 – VIDEO, PHOTO, AND PID LOG FOR BARRACUDA FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000147	Entrance Signage	Comingled Permit # and Well Names
P1000148	Entrance Signage	Facility Name for Kraner Unit
MOV_0057	Sump next to VRU #2	Leak from side PVC vent; Connected to the skids of VRU #1 and VRU #2
MOV_0058	Compressor #3	Packing vent
MOV_0059	Compressor #1	Packing vent

MOV_0060	Sump between compressors #1 and #2	2 PVC vents on the sump
MOV_0061	Compressor #1	Packing vent
Notes:	Flaring at the facility could be seen as EPA was driving to the facility. The Facility Operator told EPA that the facility had been brought back online, moments ago. The compressor located at the north-east side of the facility was in the start-up process as EPA arrived, resulting in visible emissions from the compressor blowdown vent stack. PID measurements at the RVP heater (HAP-1000) sump vent ranged between 1,010 ppm and 1,682 ppm above background concentrations. Justin Van Ness opened the sump lid, to reveal the sump was around half full of liquid with a visible layer of hydrocarbon separation present and a "lighter fluid-like" smell was detected emanating from the sump. The PID measurements were > 20,000 ppm above background concentrations at the vent from the sump that collected the drainage from the recently started compressor. Upon questioning by EPA, Aaron Hutchinson indicated that Marathon SOPs prohibit personnel from dumping toxic solvents or other hazardous waste into the facility sump. According to Aaron Hutchinson, the sump is not rated for hydrocarbon service. PID measurement was 200 ppm above background at the sump vent near the AJAX intermediate compressor which was not connected to any equipment. The walls of the sump were coated with brown tar-like fluid. On September 28, 2016, at 15:42 the EPA inspection team re-entered the Barracuda Facility to visit the recently shutdown Kraner Unit B facility. EPA inspectors verified that the equipment was shutoff and empty except for the test separator. No emissions were seen while viewing the facility equipment, tanks, and piping with the FLIR camera. The facility had been shut down after Barracuda was brought online; all product was being routed to Barracuda for separation and storage.	

BLACKJACK FACILITY
Date: September 28, 2016
Arrival Time: 9:43 AM
Exit Time: 10:45 AM
GPS Coordinates: N 28º 49.687', W 97º 52.863'
Temperature: 78 ºF
Weather Conditions: Sunny, no clouds, light winds to the South

TABLE 8 – VIDEO, PHOTO, AND PID LOG FOR BLACKJACK FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000150	Entrance Signage	Comingled Permit # and Well Names
P1000151	Sump with Bucket	Sump closest to VRU with Bucket
P1000152	Vapor Recover Unit	VRU
MOV_0062	VRU #2	Back pressure control valve

MOV_0063	VRU #250	Back pressure control valve
MOV_0064	Valve ADV-2101 near heater treater #1	Valve
MOV_0065	Compressor #12-0312	Packing vent
MOV_0066	Sump between compressor #12-0312 and non-numbered compressor (located nearest to the gate)	PVC vent on the lid of the sump
MOV_0067	Condensate tank ABJ-2100	Thief hatch
MOV_0068	Condensate tank ABJ-2120	Thief hatch
Notes:	PID measurement downwind of the tank battery was 0.493 ppm above background concentration. The most northern compressor sump vent exhibited a PID measurement that was 1,660 ppm above background concentration and the vapors from sump vent smelled like lighter fluid. The PID measurement for the most eastern compressor sump vent was 122 ppm above background concentration. The PID measurement for the sump connected to the VRUs was 40 ppm and there was a metal bucket coated in black tar sitting on the top of the sump lid. An organic paint-like smell was exhibited emanating from the VRU sump.	

HEMBY UNIT B PAD FACILITY
Date: September 28, 2016
Arrival Time: 10:50 AM
Exit Time: 11:06 AM
GPS Coordinates: N 28° 50.047', W 97° 52.396'
Temperature: Not Recorded
Weather Conditions: Not Recorded

TABLE 9 – VIDEO, PHOTO, AND PID LOG FOR HEMBY UNIT B PAD*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000153	Entrance Signage	Facility Name, Location, and Emergency Contact Info
P1000154	Level Actuator	Level Actuator depicting location of emissions was found with the FLIR
MOV_0069	Separator #AC-3H	Level control for oil side of the separator
MOV_0070	Separator #303H	Level control for oil side of the separator
MOV_0071	Separators #3H and #4H	Level controls for oil side of the separators
Notes:	Six well heads and six test separators were located at the well pad. According to Kimber Hamilton, the test separators are used to meter the well production for royalty purposes, only, and after separation the material streams are	

	comingled before entering the production facility for separation into material streams for transportation and processing. PID measurements at the emitting level actuators on the separators ranged between 40 ppm to 124 ppm above background concentration.

CENTRAL LONGHORN FACILITY
Date: September 28, 2016
Arrival Time: 11:28 AM
Exit Time: 12:55 PM
GPS Coordinates: N 28º 53.925', W 97º 56.214'
Temperature: 82 ºF
Weather Conditions: Sunny, light to moderate winds to the South

TABLE 10 – VIDEO, PHOTO, AND PID LOG FOR CENTRAL LONGHORN FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000155	Entrance Signage	Comingled Permit # and Well Names
MOV_0072	Sump next to VRU #4	Leak coming from under the lid; five VRU skids and 3 pipeline LACT unit skids connected to pump
MOV_0073	VRU CCS-1520	Back pressure control valve leak
MOV_0074	VRU CCS-1520	Bolt on pump; Immediately fixed and verified with camera
MOV_0075	Compressor #4	Packing vent
MOV_0076	Compressor #5	Packing vent
MOV_0077	Compressor #3	Packing vent
MOV_0078	Compressor #2	Packing vent
Notes:	The LACT unit and the bottom end of the scrubber on the VRUs connect to piping that drains into the sump located near the VRUs. The sump vent located near the VRUs exhibited PID measurements 549 ppm above background concentration and inside clear fluid was actively dripping into the sump via a drain. The ferrule fitting was leaking condensate at VRU #2, however, the leaking was stopped when a Facility Operator tightened the fitting. PID measurements from the compressor sump vents ranged between 40 ppm and 60 ppm.	

NORTH LONGHORN FACILITY
Date: September 28, 2016
Arrival Time: 13:08 PM
Exit Time: 14:12 PM
GPS Coordinates: N 28º 52.469', W 98º 0.349'
Temperature: 88 ºF
Weather Conditions: Sunny, light to moderate winds to the South

TABLE 11 – VIDEO, PHOTO, AND PID LOG FOR NORTH LONGHORN FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000156	Entrance Signage	Comingled Permit # and Well Names
MOV_0079	VRU #1	Flange on the scavenger line
MOV_0080	VRU #2	Back pressure control valve
MOV_0081	VRU #3	Flange on top of discharge separator;
MOV_0082	N/A	Lens cap
MOV_0083	Compressor #11-0011	Packing vent and level controller on scrubber
MOV_0084	Compressor #11-0207	Packing vent
MOV_0085	Compressor #11-0207	Packing vent & level control valve
MOV_0086	Compressor #11-0207	Visible light (normal) mode video of MOV_0085
MOV_0087	Compressor #13-0320	Norriseal level control valve on 2nd stage scrubber
MOV_0088	Compressor #13-0320	Level control valve on 3rd stage scrubber
MOV_0089	VRU #3	Flange and scrubber on VRU; scrubber leak fixed, still slight leak on flange
Notes:	PID measurements at the sump vents located in between the compressors and the sump vent located near the VRU ranged from 4.0 ppm and 68 ppm above background concentration. The flange on the discharge Separator of VRU #3 was found leaking and partially fixed when the facility operator tightened the fittings.	

CHALLENGER CENTRAL FACILITY
Date: September 28, 2016
Arrival Time: 14:21 PM
Exit Time: 15:03 PM
GPS Coordinates: N 28° 54.649', W 97° 59.503'
Temperature: 92 °F
Weather Conditions: Sunny, intermittent light winds to the South

TABLE 12 – VIDEO, PHOTO, AND PID LOG FOR CHALLENGER CENTRAL FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000157	Entrance Signage	Comingled Permit # and Well Names
P1000158	Sump	Photograph of Sump prior to being placed in ground.
P1000159	Sump	Photograph of Sump prior to being placed in ground.

MOV_0090	Sump between compressors #13-0331 and #11-0065	Leak out from under concrete lid along the front and the back of the sump
MOV_0091	Sump between compressors #13-0331 and #11-0065	Video from the other side of the sump
MOV_0092	Compressor #13-0331	Packing vent leak
MOV_0093	Compressor #13-0335	2nd stage scrubber level controller leak
MOV_0094	Sump next to Compressor #13-0335	Leaks out of PVC pipe vents on lid of the sump
MOV_0095	Low Pressure flare	Visible light (normal) mode only
MOV_0096	Condensate tanks #9 and #10	Thief hatches
Notes:	PID measurements at the sump vents located in between the compressors were both >20,000 ppm above background concentration. The sump vent located closest to the VRUs exhibited a PID measurement of 25 ppm above background concentration.	

SUGARHORN CENTRAL FACILITY
Date: September 28, 2016
Arrival Time: 15:17 PM
Exit Time: 16:01 PM
GPS Coordinates: N 28º 50.555', W 97º 59.277'
Temperature: 92 ºF
Weather Conditions: Sunny, intermittent light winds to the South

TABLE 13 – VIDEO, PHOTO, AND PID LOG FOR SUGAR HORN FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000160	Entrance Signage	Comingled Permit # and Well Names
MOV_0097	Compressor #11-0105	3rd stage scrubber valve
MOV_0098	Compressor #11-0206	Packing vent leak
MOV_0099	VRU #1	Back pressure control valve
MOV_0100	Not Applicable	None
MOV_0101	VRU #2	Back pressure control valve
MOV_0102	VRU #3	Back pressure control valve
Notes:	Construction occurring at the facility. The two end compressors were offline. PID measurements at the sump vents located in between the most western oriented compressor was 600 ppm and the other two sumps located in between the compressors were between 12 and 13 ppm above background concentration. The sump vent located closest to the VRUs exhibited a PID measurement of 0.5 ppm above background concentration.	

COY CITY RANCH UNIT A FACILITY
Date: September 29, 2016
Arrival Time: 10:02 AM
Exit Time: 10:32 AM
GPS Coordinates: N 28º 48' 20.37", W 98º 03' 10.10"
Temperature: 72 ºF
Weather Conditions: Sunny, light winds to the South

TABLE 14– VIDEO, PHOTO, AND PID LOG FOR COY CITY RANCH UNIT A FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000161	Entrance Signage	Facility Name, Co-mingled Permit #, Location, and Emergency Contact Info
MOV_0103	Sump located next to the compressor	Leak from side of sump
MOV_0104	Analyzer discharge	Discharge vent for gas analyzer
Notes:	PID measurements at the sump vent located nearest the compressor was 400 ppm above background concentrations. The flare was smoking for less than 2 minutes while inspecting the facility at 10:10 AM and at 10:26 AM.	

COY CITY RANCH UNIT B FACILITY
Date: September 29, 2016
Arrival Time: 10:39 AM
Exit Time: 11:20 AM
GPS Coordinates: N 28º 49.525, W 98º 2.992'
Temperature: 82 ºF
Weather Conditions: Sunny, moderate winds to the South

TABLE 15– VIDEO, PHOTO, AND PID LOG FOR COY CITY RANCH UNIT B FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000162	Entrance Signage	Facility Name and Emergency Contact Info
MOV_0105	Condensate tank #3	Thief hatch
MOV_0106	Condensate tank #1 and water tank	Thief hatch
MOV_0107	Tank farm	Tank farm overview from near the combustor
MOV_0108	Combustor	Combustor exhaust
Notes:	PID measurement downwind of the tanks was 1.0 ppm above background concentration. All tanks were emitting in HSM mode while viewing them through the FLIR camera. The enclosed combustor had an average temperature of 340 ºF during the last 24 hours, as indicated by Mike Crabb	

	who obtained the information via radio to operators monitoring the SCADA system.

EAST LONG HORN FACILITY
Date: September 29, 2016
Arrival Time: 11:49 AM
Exit Time: 12:26 PM
GPS Coordinates: N 28º 52.221, W 97º 55.841'
Temperature: 84 ºF
Weather Conditions: Sunny, moderate winds to the South

TABLE 16 – VIDEO, PHOTO, AND PID LOG FOR EAST LONGHORN FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000163	Entrance Signage	Comingled Permit # and Well Names
MOV_109	VRU #4	Back pressure control valve
MOV_0110	Compressor #11-0016	Packing vent
MOV_0111	Compressor #11-0204	Packing vent
Notes:	Construction was occurring at the facility to in order to finalize a new compressor installation. PID measurements at the sump vent located nearest the compressor oriented south-east was 494 ppm above background concentration. PID measurement at the sump vents between the other compressors ranged between 0.5 ppm and 1.0 ppm.	

BORIS CENTRAL FACILITY
Date: September 29, 2016
Arrival Time: 1:35 PM
Exit Time: 2:00 PM
GPS Coordinates: N 28º 57.818, W 97º 49.796'
Temperature: 90 ºF
Weather Conditions: Sunny, winds to the South

TABLE 17 – VIDEO, PHOTO, AND PID LOG FOR BORIS CENTRAL FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000161	Entrance Signage	Facility Name, Co-mingled Permit #, Location, and Emergency Contact Info
MOV_0112	Condensate Tank #6	Thief hatch
MOV_0113	Water tanks #20049949 and #200449951	Thief hatch

Notes:	PID measurement at the sump vent located in between the compressors was 7.0 ppm above background concentration.

REYNOLDS FACILITY
Date: September 29, 2016
Arrival Time: 2:20 PM
Exit Time: 3:07 PM
GPS Coordinates: N 28º 54.549, W 97º 46.744'
Temperature: Measurement Not Taken
Weather Conditions: Sunny, winds to the South

TABLE 18– VIDEO, PHOTO, AND PID LOG FOR REYNOLDS FACILITY*
**Note that files contain metadata such as date, time, and GPS Coordinates.*

File Number	Location	Description
P1000165	Entrance Signage	Comingled Permit # and Well Names
MOV_0114	Water tank in 2nd row of tanks	Thief hatch
MOV_0115	Condensate tank #90788	Thief hatch
MOV_0116	Condensate tank #90001	Thief hatch
MOV_0117	Condensate tank #90793 and unknown tank number	Thief hatches
Notes:	PID measurement downwind of the tank battery was 0.5 ppm above background concentration. PID measurement at the sump vent located nearest the VRU was 168 ppm above background concentration. A compressor was in process of being replaced during the site visit. PID measurement at the sump vent located nearest the compressor (that was in operation) was 77 ppm above background concentration.	

ATTACHMENTS

1. Facility Site Plans
2. Sump and Equipment Drain Diagrams

ATTACHMENT 1
Facility Site Plans

ATTACHMENT 2
Sump and Equipment Drain Diagrams